values based on the error reduction for one of the combinations of source and destination color imaging devices.

REMARKS

In this Amendment, Applicants have amended the specification, amended claims 1, 2, 7, 10, 11, 12, 14, and 19, and added new claims 47-49. Accordingly, claims 1-5, 7-23, and 25-49 are pending in the present application.

Applicants have amended the specification and claims 1, 2, 11, 12, 14, and 19 to more appropriately define the invention, and correct a minor error. Specifically, Applicants have amended the specification and claims 1, 2, 11, 14, and 19 to change each occurrence of "recursively" to --iteratively.--. The amendment to the specification and claims 1, 2, 11, 14, and 19 is clearly supported by Applicants' disclosure as originally filed.

FIG. 6, for example, illustrates a method in which device coordinates are adjusted in an *iterative* manner to reduce error. See blocks 608, 610, and 612. Similarly, at page 25, lines 3-16, the specification describes an iterative process that involves "repeatedly querying the destination device profile interpreter 508 with selected estimates of destination device coordinates" to "reduce the error between the source and destination" values. At page 34, line 18, to page 35, line 6, the specification describes a process that "repeats until the error is reduced."

Clearly, the specification and drawings suggest an iterative process, i.e., one that is repeated until a criterion is satisfied, rather than one that is recursive, i.e., one that invokes itself. Thus, the reference to a recursive process in the specification and claims was in error and contrary to the meaning conveyed to and understood by those skilled in the art in view of Applicants' disclosure as a whole. Accordingly, Applicants respectfully request entry of the amendments to the specification and claims 1, 2, 11, 12, 14, and 19.

In the Office Action, the Examiner allowed claims 39-46. The Examiner raised several new grounds of rejection, however, with respect to claims 1-5, 7-23, and 25-38. In particular, the Examiner rejected claims 1, 3-5, 11, 15-18, 21-23, 26, 28, 30, 32, 34, 36,

and 38 under 35 U.S.C. 103 as being unpatentable over U.S. Patent No. 5,754,184 to Ring et al.

Also, the Examiner rejected claims 7, 8, and 14 under 35 U.S.C. 103 as being unpatentable over Ring et al. in view of European Patent Application No. 0706285 to Ohta, and rejected claim 9 under 35 U.S.C. 103 as being unpatentable over Ring et al. in view of Ohta and the ICC Profile Specification Format 3.3 of November 1996 ("ICC").

Finally, the Examiner rejected claims 10, 12, 13, and 19 under 35 U.S.C. 103 as being unpatentable over Ring et al. in view of Ohta and U.S. Patent No. 5,903,275 to Guay; rejected claims 2, 20, and 21 under 35 U.S.C. 103 as being unpatentable over Ring et al. in view of Stone et al.; and rejected claims 25, 27, 29, 31, and 35 (and apparently 37) under 35 U.S.C. 103 as being unpatentable over U.S. Patent No. 5,786,823 to Madden et al.

Applicants note that the rejection of claim 21 in view of Ring et al. and Stone et al. appears to be somewhat redundant inasmuch as the Examiner also rejected claim 21 in view of Ring et al. alone. Applicants further note that each of claims 25, 27, 29, 31, 35 and 37 is dependent on an independent claim, i.e., claims 1, 7, 10, 11, 14, and 19, respectively. For this reason, it appears that the Examiner may have considered Madden et al. to also render obvious those independent claims, or that the Examiner intended the rejection of claims 25, 27, 29, 31, 35, and 37 to be formulated on the basis of Madden et al. in combination with the other references asserted with respect to those independent claims. Applicants would appreciate clarification in the next action.

Applicants respectfully traverse the various rejections under section 103. The applied references fail to disclose or suggest the inventions defined by the claims. Moreover, such references provide no teaching that would have suggested the desirability of modification to arrive at the claimed inventions. For conciseness, Applicants' remarks below generally address the basic shortcomings in the Ring et al., which formed the primary basis for the rejections under section 103.

In contrast to the methods of claims 1-5 and 11 or the data storage medium of claims 19-23, neither Ring et al. nor any of the other applied references suggests the use of forward transformation profiles to generate device-independent color values for source

and destination imaging systems, with calculation of color conversions by iteratively reducing differences between the device-independent color values for combinations of source and destination systems, and construction of color maps using the color conversions and user preferences.

In the Office Action, the Examiner characterized Ring et al. as disclosing each of the above features, pointing to col. 2, lines 33-63. Applicants respectfully disagree with the Examiner's assessment of the Ring et al. reference. Applicants are unable to find a teaching of such features within the passage cited by the Examiner, nor elsewhere within the Ring et al. reference. Ring et al. makes no mention of the use of forward transformation profiles, as claimed, or reduction of differences in device-independent color values produced with the forward transformation profiles. Instead, in the cited passage, Ring et al. simply describes conversion of source device color values to tristimulus values, followed by conversion of the tristimulus values to destination device color values. Col. 2, lines 49-63. Hence, Ring et al. appears to contemplate use of reverse transformation to produce the destination device color values.

Ring et al. also provides no teaching that would have suggested, for a selected combination, determining whether one of the color maps corresponds to the selected combination and selected user preferences and, if so, retrieving the corresponding color map, or if not, constructing a new color map. The Examiner referred to Ring et al., at col. 5, lines 13-19, and col. 4, lines 5-21, as disclosing such features. In the former passage, however, Ring et al. merely describes an exemplary computer system 22 with storage media for storage of color information in general, and does not discuss storage of color maps for particular combinations and user preferences as claimed. In the latter, Ring et al. refers to the use of a common intermediate color metric to account for different viewing conditions for all input devices, and not the retrieval of predefined color maps for particular input and output device combinations.

The Ring et al. reference provides no teaching that would have suggested the above features, nor the desirability of modification to include them. Moreover, the various secondary teachings (Ohta, ICC, Guay, and Stone et al.) relied upon by the Examiner fail to cure the basic deficiencies evident in Ring et al. relative to the inventions

of claims 1-5, 11, and 19-23. Absent access to Applicants' disclosure, one of ordinary skill in the art would have had no appreciation of the inventions defined by amended claims 1-5, 11, and 19-23. Therefore, Applicants respectfully request withdrawal of the rejection of claims 1-5, 11, and 19-23 under section 103.

Ring et al. also does not disclose the features required by amended claims 7-10. Amended claims 7-10 require, for example, generation of device-independent color values for a source color imaging system that have the same dimensionality as the source color imaging system so that black channel values can be generated independently of other color channel values. As described in Applicants' disclosure, transformation between color imaging systems can result in loss of black (K) channel information due to a difference in dimensionality between the device-dependent and device-independent color coordinates.

Generation of black channel values independently, as claimed, can preserve dimensionality and avoid loss of black channel information, providing improved accuracy when the device-independent color space used for the conversion otherwise lacks the same dimensionality as the device color coordinates. Ring et al. describes the conversion of device-dependent RGB values to device-independent XYZ tristimulus values. Consequently, the Ring et al. reference does not take into account the need to handle black channel information, as set forth in amended claim 7-10.

Claims 7-10 also require definition of a color map for transforming colors between color imaging systems using a color conversion and user preferences. The color conversion is performed using profiles that characterize the color imaging systems to generate device-independent color values for a source color imaging system. According to claims 7-10, in the event the color map was defined based on existing user preferences, it is applied to transform color between the color imaging systems.

In the event the color map was not defined based on the existing user preferences, however, the color map is redefined using the color conversion and the existing user preferences, as recited in amended claims 7-10. Thus, it is not necessary to redefine the device profiles when user preferences change. In particular, the color conversion

performed on the basis of the device profiles for a combination of devices can be used with the user preferences to redefine the color map.

As discussed above, Ring et al. lacks any teaching that would have suggested such features. Again, Ring et al. merely describes the use of a common intermediate color metric to account for different viewing conditions for all input devices, and not the retrieval of predefined color maps for particular input and output device combinations and user preferences. Ohta describes nothing more than conversion of device-dependent color values (RGB) to device-independent color values (L*, a*, b*), and conversion of the device-independent color values to device-dependent color values (CMYK).

Claims 12 and 13 define construction of a color map as a function of both user preferences and adjusted color coordinates that represent a reduction in error between first and second device-independent color coordinates. The color map is used to transform colors between the color imaging systems in the event the color map was defined based on existing user preferences. In the event the color map was not defined based on the existing user preferences, however, the color conversion and the existing user preferences are used to redefine the color map. As discussed above, Ring et al. lacks any teaching that would have suggested such features. Again, Ring et al. describes the use of a common intermediate color metric to account for different viewing conditions for all input devices, and not the retrieval of predefined color maps for particular input and output device combinations and user preferences.

Amended claims 14-18 recite a system having a computer arrangement programmed to construct a color map using color conversions and user preferences. The computer arrangement uses the color map to transform colors between the color imaging systems in the event the user preferences are unchanged, but redefines the color maps in the event the user preferences have changed using the color conversion and the changed user preferences. Ring et al. describes the use of a common intermediate color metric to account for different viewing conditions for all input devices. Ring et al. does not suggest the use of predefined color maps for particular input and output device combinations and user preferences. Therefore, the system of claims 14-18 is nonobvious over such references.

With respect to claims 25, 27, 29, 31, 35, and 37, the Examiner cited Madden et al. If combined with Ring et al., Madden et al. provides no teaching to cure the basic deficiencies in Ring et al. If taken alone, Madden et al. clearly lacks the essential requirements of independent claims 1, 7, 10, 11, 14, and 19, as described above. Indeed, the Examiner pointed to no teachings that would correspond to those features. Rather, the Examiner essentially relied upon Madden et al. as disclosing the generation of color signals based on illuminance level and human observer conditions. Without more, Madden et al. cannot support a prima facie case of unpatentability with respect to Applicants' independent claims.

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and prompt allowance of the pending claims. The Assistant Commissioner is authorized to charge any additional fees, including any late fee, or credit any overpayment to Deposit Account No. 09-0069.

Respectfully submitted,

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